



**THE UPPER CLARK FORK RIVER BASIN
RESTORATION GRANT APPLICATION**

2006 GRANT CYCLE

**DRINKING WATER
INFRASTRUCTURE REPLACEMENT
GRANT APPLICATION
YEAR 6**

**SUBMITTED BY:
THE CITY AND COUNTY OF BUTTE-SILVER BOW**

February 2006

STEP 1. APPLICANT INFORMATION AND PROJECT SUMMARY FORM

1. **Name of Applicant(s)** The City and County of Butte-Silver Bow
2. **Project Title** Drinking Water Infrastructure Replacement Years 6 and 7
3. **Type of Entity*** City - County

(***Corporation** and **Foundation** applicants are required to submit corporation information as follows: articles of incorporation and Certificate of Good standing. **Partnership** applicants are required to submit a Partnership Agreement and a list of the names of the Partners. **Limited Liability Company** applicants are required to submit Articles of Organization, a list of the members/managers, and Certificate of Good Standing. **Associations** are required to submit a list of members, Articles of incorporation and Certificate of Organization. **Please attach these documents to this form.**)

4. **Description of Project Location. Attach map-showing location.**

Within the urban area of the City-County of Butte-Silver Bow and the geographical extent of the surface area where the groundwater cannot be used for drinking.

5. *Injured Natural Resource(s) and/or Impaired Services to be Restored, Rehabilitated, Replaced or Equivalent Acquired through Project.*

Bedrock groundwater resources have been permanently damaged and the applicant proposes to replace lost resource and impaired services with improvements to drinking water system.

6. Authorized
Representative: Paul Babb Chief Executive
(Name) (Title)
Mailing Address: Courthouse, 155 W. Granite Street
(Street/PO Box)
Butte, MT 59701 406) 497-6220
(City/State/Zip) (Telephone)
Contact Person*: Jean Pentecost, P.E. Project Engineer
(Name) (Title)
Mailing Address*: 126 W. Granite Street
(Street/PO Box)
Butte, MT 59701 (406) 497-6530
(City/State/Zip) (Telephone)

E-mail Address: jpentecost@co.silverbow.mt.us

(*For Corporate, Partnership, L.L.C., or Cooperative Association applicants, list Registered Agent and Office for Service of Process)

7. Proposed Funding Sources

On the table below, enter the source and amount of all funding that may be used for this project. Indicate all potential sources of funds that you intend to apply for this project, even if you have not yet applied for the funds or have not yet received a commitment from the source.

BUTTE-SILVER BOW - DRINKING WATER INFRASTRUCTURE REPLACEMENT PROJECT - YEAR 6

Funding Source	Amount				Committed Source
	Grant (\$)	Loan (\$)	Other (\$)	Total (\$)	
A. UCFRB Restoration Law	\$1,819,581			\$1,819,581	
B. Butte-Silver Bow In-Kind Match			\$45,745	\$45,745	
C Butte-Silver Bow Cash Match			\$560,782	\$560,782	

8. Estimated Total Project Cost For Year 6 \$ \$2,426,108

BUTTE-SILVER BOW - DRINKING WATER INFRASTRUCTURE REPLACEMENT PROJECT - YEAR 7

Funding Source	Amount				Committed Source
	Grant (\$)	Loan (\$)	Other (\$)	Total (\$)	
A. UCFRB Restoration Law	\$1,873,742			\$1,873,742	
B. Butte-Silver Bow In-Kind Match			\$46,549	\$46,549	
C Butte-Silver Bow Cash Match			\$	\$578,302	

8. Estimated Total Project Cost For Year 7 \$ \$2,498,323

9. Private (non-Government) Grant Applicant Financial Information

- a. Are there any lawsuits, judgments, or obligations pending for or against you? **NO**
- b. Have you ever declared bankruptcy? **NO**
- c. Are any of your tax returns delinquent or under dispute? **NO**
- d. Any unpaid deficiencies? **NO**
- e. Are you a party to a lawsuit? **NO**
- f. Do you have any other contingent liabilities? **NO**
- g. Do your current and deferred liabilities exceed the value of your assets? **NO**

Explain all **YES** answers in a statement attached to this form.

10. Certification for Individuals or Public Entities

Individuals or private entities requesting grant funds must sign the following certification.

CERTIFICATION FOR INDIVIDUALS OR PRIVATE ENTITIES

I (We) the undersigned, have provided this financial information as part of my (our) application for a grant from the UCFRB Restoration Fund. I (We) certify that the statement is complete and accurate to the best of my (our) knowledge and I (we) authorize the State of Montana to investigate my credit worthiness and any of the matters described above.

Individual(s)

_____ Name	_____ Social Security No.	_____ Signature	_____ Date
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_____ Name	_____ Social Security No.	_____ Signature	_____ Date
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Social Security Numbers will be keep confidential

Private Entities

<u>Butte-Silver-Bow Govn't</u>	<u>81-0368698</u>	_____ Signature	_____ Date
Name of Authorizing Agent	Federal Tax ID No.		

11. Authorizing Statements

An authorized agent/agents representing the applicant must by his/her signature indicate that the application for funds and expenditure of matching funds, as represented, is officially authorized.

GRANT AUTHORIZATION

I hereby declare that the information included in and all attachments to this application are true, complete, and accurate to the best of my knowledge, and that the proposed project complies with all applicable state, local, and federal laws and regulations.

I further declare that, for Butte-Silver Bow Government (Project Sponsor), I am legally authorized to enter into a binding contract with the State of Montana to obtain funding if this application is approved. I understand that the Governor must authorize funding for this project.

<u>Butte-Silver Bow Government</u>	_____ Date
Project Sponsor	
_____ Authorized Representative (signature)	<u>Chief Executive</u> Title

STEP 2 – PROPOSAL ABSTRACT

Applicant Name: **Butte-Silver Bow Local Government**

Project Title: **Drinking Water Infrastructure Replacement – Year 6 & 7**

Project Description and Benefits to Restoration:

Due to the adverse impacts of mining from the Berkeley Pit and the underground mines, the groundwater aquifers in portions of Butte can never be used for drinking. The NRD assessment estimates for lost groundwater resources on the Butte Hill alone exceed 5,000 gallons per minute – about the average amount of water used by all Butte citizens on a typical day (except during sprinkling season). Consequently, to protect human health, use of existing groundwater wells is limited and there are prohibitions on new wells in certain areas.

Since 1992, Butte Silver Bow has been the owner/operator of the water utility division. As a result of a settlement, water consumers inherited neglected 100-year-old system. At this same time, Butte-Silver Bow ratepayers had to invest over \$49 million (see appendix B) to restore and replace its drinking water system – a complex infrastructure to import water from across the Continental Divide and from the mountain creeks surrounding Butte. These investments were unconditional and mandatory: There were no alternative sources to develop since the local groundwater is permanently damaged, and neglected improvements by the previous owner had led to federal orders to upgrade the system.

More work is needed. Butte-Silver Bow proposes a fifteen-year program to make essential improvements to the system, particularly the need to replace deteriorated (e.g. leaking, corroded, undersized) distribution lines in the neighborhoods where groundwater use is restricted. The proposed 15-year project would result in a coordinated, annual replacement program to respond to precise areas where deficiencies are creating the most problems.

As Years Six and Seven of the project, Butte-Silver Bow requests \$3,693,323.00 in NRD funds, and pledges \$1,231,108.00 (Year 6 \$1,819,581 NRD and BSB \$ 606,527 and Year 7 \$1,873,742 and BSB \$624,581) in matching funds to replace up to a total of 34,000 feet of distribution lines over a two year period. Over 15 years, up to 255,000 feet of distribution pipes would be replaced to provide better service to those citizens who cannot use the groundwater. This long-term investment will fulfill essential priorities and also achieve effective coordination with applicable NRDP requirements.

STEP 3 – TECHNICAL NARRATIVE

Applicant Name: Butte-Silver Bow Local Government

Project Title: Drinking Water Infrastructure Replacement – Year 6 & 7

A. PROJECT NEED AND PROBLEM DEFINITION

Damaged Groundwater Resources and Sources of Contamination

Groundwater injury in the Butte area is well documented (see *Butte Groundwater Injury Assessment Report, Upper Clark Fork River NPL Sites, January, 1995*, and other NRDP documents). In the assessments, groundwater damages have been categorized into two areas, those within the Butte Mine Flooding Operable Unit and the Area One, a subset of the Butte Priority Soils Operable Unit. This 2006 NRD proposal focuses on the injury associated with the Mine Flooding area, since the Record of Decision for this Operable Unit has been issued (in 1994) and the corresponding damage claim for the Butte Hill groundwater was included in the 1998 NRD settlement. (Note: the Area One claim remains unsettled and the Record of Decision for the Butte Priority Soils Operable Unit.)

Sources of groundwater contamination in the Mine Flooding Operable Unit (and, correspondingly, the project area of this NRD proposal) include the underground workings and the mine water therein, the walls of the Berkeley and Continental Pits, waste rock and tailings piles near the Berkeley Pit, leaking solutions from the leach pad, the Weed/MR Concentrator areas, and the Yankee Doodle Tailings Pond. Again, several studies have documented the hazardous substances in the source materials as well as the pathways for groundwater contamination.

Given the adverse impacts of this contamination, the groundwater in large portions of Butte's urban area can't be used for drinking. The extent of the damage, in volumetric and economic terms, is enormous. For just the bedrock aquifer on the Butte Hill, the 1995 NRD assessment estimates lost ground water resources at 6,900 gallons per minute (gpm). By comparison, 5,000 gpm equates to seven million gallons per day, which is about the average amount of water used by Butte citizens on a typical day (except during sprinkling season). In economic terms, the 1995 NRD assessment estimated that approximately 3,000 residential properties and 350 commercial parcels are situated over the contaminated aquifers on the Hill (refer to map, Appendix A). If these aquifers were not contaminated, the residents and businesses could use a substantial portion of the groundwater resources as a source of drinking water through private wells.

However, based on the Butte Mine Flooding Operable Unit Record of Decision (in 1994), it was determined that it was "technically impractical" to remediate the contamination. The Record of Decision further stipulated that to protect human health, a ground water control area, and other restrictions needed to be put in place to limit the use of existing wells and prohibit new wells in specific areas.

Circumstances Precipitating the Need for the Project:

History of Drinking Water System Problems

Since the groundwater is unavailable for use by the community, Butte-Silver Bow is forced to rely upon a complex system of water collection, treatment, transmission and distribution facilities to meet drinking water requirements. Although many of these facilities are in need of repair or replacement, the distribution system is experiencing the most critical need.

The disrepair of the water distribution system serving the community of Butte takes two forms: 1) water mains that have reached the end of their useful life, are failing, and must be repaired; and 2) water mains that are undersized. By way of comparison, the Butte water distribution system experienced approximately 276 leaks in 2005 – more water leaks than the cities of Great Falls, Billings, Kalispell, Bozeman, Missoula and Helena combined together.

CHART 1

City Name	Number of leaks
Missoula	25
Kalispell	6
Bozeman	8
Butte	276
Helena	21
Billings	62
Great Falls	63

Compounding the leak problems, many areas of the Butte distribution system are constructed with 2” diameter and smaller mains – sizes that simply cannot convey the volume of water needed for the daily needs of the community and certainly cannot convey the fire flows needed for the community. The causes for these problems are numerous and can be traced to engineering and economic decisions made over the past century.

Until 1992 when it was transferred to public ownership, the Butte Water Company was a wholly owned subsidiary of The Anaconda Copper Mining Company (ACM). The ACM operated the Butte Water Company, primarily, for the purpose of providing water for its mining operations. An ancillary use of the water, from the standpoint of the ACM, was the provision of water to the community. As other communities invested in their public infrastructure through the construction of water filtration plants, water distribution system upgrades, and other improvements to provide better service to their customers, the Butte Water Company declined to make similar investments. Also, the mining operation did not require filtered water or an improved distribution system, and the added expense of these items could not be justified from that perspective.

As a result, improvements that normally would have been made over a period of many decades, and paid by ratepayers over that period of time, were never made. In 1986 the federal government amended the drinking water laws. Those amendments mandated filtration for two of the water

sources serving Butte. The Butte Water Company, because of the decades of under investment, found itself under capitalized and unable to make the needed multi-million dollar improvements. A service connection moratorium and boil water advisory were placed upon the system (and by extension, the city) by the state regulators, and ultimately, Butte-Silver Bow was compelled to purchase the dilapidated water system in order to ensure that needed repairs and improvements were constructed.

The lack of investment by ACM was one cause of the difficulties with the Butte water distribution system, but engineering decisions further contributed to the problems. For example, the selection of water main materials was driven by the mining activity priorities and has redounded to the detriment of the water system. The subsidence that occurs in the community because of the underground mines led the management of the Butte Water Company to select a thin wall steel pipe, known as kalamain, for the Butte water distribution system. It was felt that this pipe would be more amenable to displacement than would cast iron pipe, the most common pipe material of the day. Kalamain pipe, being steel, can bend to some extent as the ground shifts and is less likely to experience total failure. This ability results both from the pipe being steel and from its thin sidewalls that allow for some bending prior to failure. Cast iron pipe is brittle and can suffer complete failure if the ground shifts.

Cast iron mains, on the other hand, are highly resistant to corrosion, this is partly due to their thick sidewalls that contain a great deal of material and can suffer corrosion for an extended period before failure. Kalamain pipe, as a result of the steel construction and the thin sidewall, is highly susceptible to failure by corrosion. Therefore, the thin sidewall, plus the corrosive soils in Butte (a legacy of the mining activity) combined to create an environment that has resulted in a high rate of pipe failures. Virtually all of the of water main that has been replaced in Butte in the past fourteen years has been kalamain pipe.

PAST/ONGOING EFFORTS TO ADDRESS THE PROBLEM

Upon acquisition of the water system in 1992, Butte-Silver Bow immediately embarked upon an aggressive capital improvement program to repair, restore and replace the 100-year old municipal system. These investments in the 1990's were essential and unconditional: There were no alternative sources of drinking water since the local groundwater has been permanently damaged by mining activities, and the federal/state regulations mandated the improvements.

By 1994, this program had spent approximately \$30 million. This capital infusion resulted in the construction of two filtration plants, the rehabilitation of three pump stations, the construction of a nine million gallon water storage reservoir, and the replacement of 52,000 feet of water distribution mains. The boil advisory and the service connection moratorium were lifted and those impediments to economic development were removed. Since 1994, additional capital has been invested for the replacement of leaking water mains. As of December 2005, Butte-Silver Bow has replaced approximately 294,000 (Chart 2) feet of distribution and transmission mains and made system upgrades that exceed \$49 million (see appendix B).

CHART 2

Replacement Year	Money Invested	Number of Feet	
1992	\$ 480,703.00	8,650	
1993	\$ 903,863.04	21,418	
1994	\$ 941,000.00	22,298	
Cost & total footage replaced before 1994	\$ 2,325,566.04	52,366	
1995	\$ 785,500.00	12,095	
1996	\$ 832,000.00	14,929	
1997	\$ 694,224.00	25,996	
1998	\$ 1,166,120.08	31,982	
1999	\$ 1,982,902.00	28,059	
2000	\$ 2,343,176.23	27,102	
2001	\$ 1,265,155.50	18,833	
2002	\$ 2,279,171.41	25,437	17,000 NRD & 8,438 BSB
2003	\$ 2,324,730.70	28,280	16,707 NRD & 11,573 BSB
2004	\$ 2,009,745.09	29,256	17,136 NRD & 12,120 BSB
2005	\$ Not Completed _		
Cost & total footage replaced after 1994	\$ 15,682,725.01	241,969	
Cost & total of footage replaced in the past 14 years	\$ 18,008,291.05	294,335	

The leaking water mains present a public safety concern, both as a result of road hazards due to icing and as a result of the possible contamination of the water system, and have accordingly been addressed first using the available capital improvement funds. Consequently, Butte-Silver Bow has not been able to begin to address the problem of undersized water mains. Approximately 148,000 feet of two-inch water main exists within the distribution system and must be replaced with larger diameter pipe to assure adequate service.

Summary

In light of the damaged natural resources, Butte-Silver Bow proposes strategic investments in the municipal system as a way to provide partial replacement of the damaged groundwater resources from the mining activity. Our citizens are already struggling with the highest water rates in the state (for a major municipality) to pay for the improvements made thus far, and additional, major investments will exacerbate an existing financial burden. These citizens deserve better, particularly since they are precluded from using any alternatives, i.e. groundwater, to meet their needs.

B. Project Goals and Objectives

Butte-Silver Bow proposes a continuation of the fifteen-year program to make essential improvements to the municipal drinking water system infrastructure. **The primary goal of the project is to replace deteriorated (e.g. leaking, corroded, etc.) and undersized distribution lines in the neighborhoods where the use of groundwater has been lost due to mining impacts.** The 15-year project schedule would provide a coordinated, annual replacement scheme to respond to precise areas where infrastructure deficiencies are creating the most problems. Also, based on the experience over the past fourteen years, Butte-Silver Bow believes the defined amount of replacements, on the Butte hill, on an annual basis, represents the most practical amount of construction that can be undertaken by Butte-Silver Bow, utilizing a private contractor. This construction amount generally occupies a contractor for the entirety of a construction season and is an amount that does not create undue hardship (e.g. traffic rerouting, temporary water service provision) on the areas of the community involved.

CURRENT CONDITIONS

The current condition of the water distribution infrastructure, as well as the causes of this condition, has been discussed in Section A of this Technical Narrative. In summary, the unavailability of the local groundwater aquifer makes it necessary that Butte-Silver Bow procure its drinking water from remote sources and operate an extensive water distribution system for the provision of this water to the community. The lack of investment by the ACM, the use of thin-walled steel pipe for the distribution system coupled with the use of undersized pipe, and the presence of corrosive soils as a result of the mining activity, have combined to create a major infrastructure problem for the citizens of Butte-Silver Bow. The replacement of the deteriorated water distribution system is one of the highest infrastructure priorities of the community.

DESIRED FUTURE CONDITIONS

The goal of the water pipe replacement project under the Natural Resource Damage Program is to replace deteriorated and undersized water mains and better enable Butte-Silver Bow to utilize remote water sources for the provision of potable water to the community. The project will result in improved water service to the community by enhancement to:

Public Safety - through the elimination of ice and other impediments on the roadways (when leaks occur during cold weather), and through increased fire flows as a result of properly sized water pipe;

Public Health - through the elimination of pathways for contaminants to enter the water system and cause concerns for users; and

Public Convenience - through the improvement of water pressure to serve domestic needs.

System-wide, there are approximately 1,170,000 feet of distribution mains, and of that amount, approximately 75 percent, or 877,500 feet have been evaluated as needing replacement due to

operation and maintenance problems. Of those 877,500, Butte-Silver Bow has already invested over \$18 million in the past fourteen years (through 2004) to replace approximately 34%, or 294,335 feet (which is approximately 25 % of the total amount of distribution lines).

Replacement Year	Money Invested	Number of Feet	
1992	\$ 480,703.00	8,650	
1993	\$ 903,863.04	21,418	
1994	\$ 941,000.00	22,298	
1995	\$ 785,500.00	12,095	
1996	\$ 832,000.00	14,929	
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2003	\$ 2,324,730.70	28,280	16,707 NRD & 11,573 BSB
2004	\$ 2,009,745.09	29,256	17,136 NRD & 12,120 BSB
2005	\$ Not Completed	-	
Total Amount	\$ 18,008,291.05	294,335	

Water main identified	Completed to date	Feet Remaining	% Remaining
877,500	294,335	583,165	67%
15 year plan			
255,000	50,743	204,257	80%

Butte-Silver Bow would request approximately \$3,693,323.00 million (\$1,819,581 for year 6 and \$1,873,742 for year 7) in NRD funds, and provide a direct match of approximately \$1,231,108.00 (\$606,527 for year 6 and \$624,581 for year 7) annually on capital improvements to replace up to 17,000 feet of the distribution system per year for a total of 255,000 feet over the life of the 15-year project (including the Year One, Two, Three, Four and Five projects approved by the NRD program in 2001,2002, 2003, 2004 and 2005).

Year	Funding Sources		Total (\$)
	NRD	BSB	
2006	\$1,819,581.00	\$606,527.00	\$2,426,108.00
2007	\$1,873,742.00	\$624,581.00	\$2,498,323.00
Combined Total	\$3,693,323.00	\$1,231,108.00	\$4,924,431.00

When combined with the investments already made by Butte-Silver Bow, the total upgrade by 2017 will be about 458,000 feet, which represents approximately 39% of the entire water distribution system and more than 53% of the sections in most dire need of replacement.

Total Amount of Pipe	1,170,000	% of entire System
15-year Project @ 17,000	255,000	21.79%
Investments prior to 15-Year	211,362	18.07%
Prior work plus 15-year work	466,362	39.86%

Identified pipe for replacement	877,500	% of 877,500
15-year Project @ 17,000	255,000	29.06%
Prior work plus 15-year work	466,362	53.15%

The proposed level of replacement will still lag behind an accepted rule-of-thumb for a water utility, which holds that one percent of the system should be replaced each year. Given its age, the Butte-Silver Bow water distribution system should be about 80% replaced by 2017. Although not ideal, the 39% (39% represents work done prior plus 15-year work completed) target, when achieved, would still represent substantial progress toward getting caught up with the community's water infrastructure needs.

Goal No.1: Replace 34,000 linear feet of drinking water distribution lines over a two-year period and associated valves, connections and fittings

This goal will be managed and coordinated using the same process that has been practiced since 1992. That practice involves the following tasks (which are explained in detail in Sec3-C.):

- 1) Select a consulting engineering firm to oversee the project for the upcoming construction season.*
- 2) Select the water mains to be renewed during the upcoming construction season.*
- 3) Design the renewals for the selected water mains.*
- 4) Select the general contractor through a competitive public bidding process.*
- 5) Oversee the contractor during the construction season.*
- 6) Prepare record drawings for the work completed during the construction season.*
- 7) Update all internal Water Division records to reflect the newly constructed water mains and prepare to select a consulting engineering firm for the next construction season.*

Future Goal

LONG-TERM PLANNING AND ASSESSMENT

Given that the groundwater aquifer is contaminated on the Butte Hill and thus the lack of any other viable alternative to supply drinking water to our citizens, it is imperative that the existing system is sustained in a reliable and effective way. Towards that end, Butte-Silver Bow continues conduct strategic evaluations of its publicly owned and operated system to identify priorities and target investments.

In 2001, Butte-Silver Bow proposed a 15-year initiative under the NRD Program that emphasized the replacement of the leaking, faulty distribution system. Butte-Silver Bow has now successfully completed four years (2002, 2003, 2004 and 2005) of water main renewal projects using NRD grants and internal funds, is commencing with its fifth year (2006), and proposing its sixth and seventh year for 2007 and 2008 with this 2006 application. Although the water main renewal program remains the highest priority, various other components of the complex network of facilities need timely consideration to avoid serious disruptions of service.

For example, in 2002, evaluations at the Basin Creek Dam revealed that the valves had to be replaced and other upgrades were essential, which led to the 2003 application to the NRDP and project implementation in 2005. In 2000, a preliminary engineering assessment of the High Service Reservoir, which provides and augments pressure throughout the distribution system, recommended replacement as soon as possible to avoid total failure. That assessment led to a 2004 application to the NRD Program, for implementation in 2006.

Other priorities for repair and upgrade include the dam and water intake facilities on the Big Hole River, where Butte gets the greatest share of its drinking water. Also, should the filtration waiver for the Basin Creek supply be lost for any reason, it will be necessary to build a treatment plant, an extremely costly endeavor for our ratepayers. System-wide metering is another goal under consideration to encourage water conservation, control rates and maximize efficiency of the system.

Replacement of these water mains will reduce the costs associated with repair. This would allow money to be utilized for other critical upgrades. This would also reduce the amount of water loss from the system and conserve the nature resource.

Butte-Silver Bow estimated costs associated with the number of leaks and how much water can be anticipated lost due to leaks if they were neglected are; there was 276 leaks repaired in the distribution system at an estimated cost \$1000.00 per leak, the cost to Butte-Silver Bow is approximately \$276,000 per year to repair leaks. The average leak hole in Butte ranges from ¼" to ½ "in size. Using AWWA manual of Water Supply Practices, M36-Water audits and leak detection, water loss due to a leak hole ¼" in size and under 80 psi losses approximately 20 gallons per minute(gpm). This equates to approximately 28,800 gallons per day per leak. These are leaks that Butte-Silver Bow can document and repair. There are many instances that the leaks do not surface and we are unaware of the loss. To support this claim, during low flows (winter months) the average water flow into Butte is approximately 6 to 6.4 MGD. During the same period the flows at metro are approximately 3 to 3.2 MGD. So there is 3 mgd that is unaccounted for. The cost per million gallons for delivering water from the Big Hole River to Butte is approximately \$338.12 per million gallons. Chemicals costs and pumping costs were used to determine this amount. Any other costs such as labor and maintenance were not factored in. To quantify the loss as a cash amount it would be $\$338.12 \text{ per million} \times 3 \text{ MGD} = \$1,014.36 \text{ per day}$. Over the course of a year, the additional costs associated with this loss would be approximately \$370,241.40. This observation is far from being accurate because of the age of the sewer mains in Butte and because the majority of consumers are un-metered, but it can give a sense of what is occurring within the distribution system.

All of these projects – including continued replacement of faulty distribution pipelines – are important to sustain the overall operation. Butte-Silver Bow will continue to perform the assessments needed to update its management plan for the system and thus be prepared to make strategic investments at the appropriate times. This dynamic approach to system planning is essential to ensure the health and safety of the community.

C. IMPLEMENTATION PLAN: Project Tasks and Activities

In this section, the implementation plan along with the specific tasks and activities necessary to accomplish the work under the primary goal are described.

PROJECT GOAL:

Replace up to 34,000 linear feet of drinking water distribution lines over a two-year period and associated valves, connections and fittings

Task 1. Select a consulting engineering firm to oversee the project for the upcoming construction season.

Specific Activities:

- 1) Issue a Request for Proposals (RFP) for consulting engineering services or, in the alternative, negotiate the continuation of services from the consulting engineer selected under this process previously.
- 2) Receive responses from the RFP, evaluate the responses and select an engineering firm.

Project Staff Required - Public Works Director, 20 hours
Water Division Engineer / Operations Manager, 40 Hours

Discussion. Project staff will need to secure Butte-Silver Bow Council of Commissioner approval to solicit an RFP for consulting engineering services. The RFP is then prepared and a legal notice of the RFP is advertised. Following the deadline for submission, the RFP responses are reviewed and a consulting engineering firm is selected.

Task 2. Select the water mains to be renewed during the upcoming construction season.

Specific Activities:

- 1) Review available information.
- 2) Select water mains to be replaced during the upcoming construction season.

Project Staff Required - Public Works Director, 38 hours
Water Division Engineer / Operations Manager, 56 Hours
Water Division Personnel, 120 Man-hours

Discussion. The Water Division of the Butte-Silver Bow Department of Public Works manages a database of all leaks and other maintenance information about the distribution system. Water Division personnel in conjunction with the consulting engineer would review this database, along with water system maps. Based on the leak history and other factors, such as public safety and Water Division personnel safety, the water mains to be renewed during the upcoming construction season are selected.

Task 3. Design the renewals for the selected water mains.

Specific Activities:

- 1) Engineering Consultant to design water main renewals for selected streets.
- 2) Water Division personnel to review and approve designs.
- 3) Submit the designs to the State DEQ for approval.

Project Staff Required - Public Works Director, 52 hours
Water Division Engineer / Operations Manager, 60 Hours
Water Division Personnel, 120 Man-hours

Discussion. The consulting engineer performs the design of the water main renewal and then creates plan sheets that detail the work to be performed. These plan sheets and specifications are used for the bidding process and during actual construction. The Water Division personnel work with the consulting engineer during this process and review the designs once complete. The consulting engineer then submits the designs to the State Department of Environmental Quality for approval.

Task 4. Select the general contractor through a competitive public bidding process.

Specific Activities:

- 1) Engineering Consultant prepares bid package.
- 2) Advertise bid for the project.
- 3) Conduct pre-bid conference, as necessary.
- 4) Select general contractor to perform the construction.

Project Staff Required - Public Works Director, 8 hours
Water Division Engineer / Operations Manager, 12 Hours
Water Division Personnel, 12 Man-hours

Discussion. The consulting engineer prepares a bid package that contains plans, specifications, general conditions, and a contract. The project is advertised in the legal notices of the newspaper and sealed bids are received and opened at a meeting of the Council of Commissioners. The Public Works Department personnel, in conjunction with the consulting engineer, reviews all bids submitted. The Department prepares a recommendation for award of a contract for construction and presents this recommendation to the Council of Commissioners. The Council awards the project and a contract is executed between the general contractor and Butte-Silver Bow. The contract specifies that all necessary permitting, regulatory approvals and access agreements are the responsibility of the contractor. These permits may take the form of storm water discharge permits, chlorinated water discharge permits, stream access and construction permits.

Task 5. Oversee the contractor during the construction season.

Specific Activities:

- 1) Consulting Engineer and Water Division personnel provide services during the construction phase to assure quality control.

Project Staff Required - Public Works Director, 164 hours
Water Division Engineer / Operations Manager, 160 Hours
Water Division Personnel, 140 Man-hours

Discussion. The Water Division personnel and the Consulting Engineer oversee the contractor throughout the construction phase of the project. The oversight is intended to assure that the contractor builds the project in conformance with the approved plans and specifications. The consulting engineer will review all pay requests submitted by the Contractor for completeness and accuracy. The consulting engineer will make recommendations to the Public Works Department regarding the pay estimates.

Task 6. Prepare record drawings for the work completed during the construction season.

Specific Activities:

- 1) Consulting Engineer and Water Division personnel review all field notes and construction records.
- 2) Consulting engineer incorporates this information into final record drawings that document the work completed during the construction season.

Project Staff Required - Public Works Director, 34 hours
Water Division Engineer / Operations Manager, 40 Hours
Water Division Personnel, 80 Man-hours

Discussion. All available records are reviewed. The consulting engineer then transfers pertinent information to the final drawings that detail the work accomplished during the construction season. These drawings are submitted by the consulting engineer to the State Department of Environmental Quality to demonstrate that the work was accomplished in accord with the approved plans.

Task 7. Update all internal Water Division records to reflect the newly constructed water mains and prepare to select a consulting engineering firm for the next construction season.

Specific Activities:

- 1) Water Division personnel update all records to reflect the construction activity for the season.
- 2) Prepare to select engineer and move forward with program in the subsequent year.

Project Staff Required - Public Works Director, 34 hours
Water Division Engineer / Operations Manager, 40 Hours
Water Division Personnel, 100 Man-hours

Discussion. Water Division personnel update all internal records such as system maps, valve books, service cards, and construction files to reflect the work completed during the season. Records are also reviewed to determine the approximate location of main renewals for the next construction season.

Other support staff for all tasks includes;
Electrician for stop lights repairs.
Water Division accountant for budgeting.
Metro sewer for sewer locates
County Attorney's office for legal advice.

{PRIVATE }

As reflected on the Milestone Chart (below), the tasks will be conducted and completed over a 12-month period. The Schedule anticipates that NRD grant funds will be available in January 2007. The chart includes Project Management task (last row), a general task that will occur throughout the project; the task would include any contract reports (e.g., quarterly management reports) to be submitted to the NRDP staff. The chart also reflects other points where key milestones will be achieved (coded with a dot).

[illegible]

[illegible]

E. METHODS AND TECHNICAL FEASIBILITY

Project Methods

The Butte-Silver Bow Department of Public Works, Water Utility Division, has extensive experience with the replacement of water mains within the community. The deteriorated condition of the water distribution system caused Butte-Silver Bow to create procedures for water main replacements when the water system was acquired in 1992.

These water pipe replacements are accomplished using the standard open trench technique. The following photograph shows a construction crew replacing a water main in a Butte street.



Under this procedure, the asphalt on the street overlying the water main is removed. A ditch is dug to the water main and the old pipe is removed and discarded. New water pipe is then installed, typically at the same depth and in the same alignment as the old pipe. Next, the water service lines to individual properties and other branch connections are re-established. The water main is then tested hydrostatically, followed by backfill of the trench and re-pavement of the street. Prior to the line being placed into service, a bacteriological test is performed.

Project Feasibility

Since acquisition of the water system, Butte-Silver Bow has pursued an ambitious water main renewal program and has amassed a wealth of experience in the proper techniques for this work. The proposed project will utilize design, construction, and monitoring procedures that have proven successful in the past.

The following table summarizes main replacements, by year, since City-County ownership in 1992 (Includes replacements done by Butte-Silver Bow as well as replacements done by contractors):

<u>Year</u>	<u>Footage of Water Main Replaced</u>
1992	8,650
1993	21,418
1994	22,298
1995	12,095
1996	14,929
1997	25,996
1998	31,982
1999	28,059
2000	27,102
2001	18,833
2002	25,437 (17,007 feet NRD/BSB funded & 8,438 BSB funded)
2003	28,280 (16,707 feet NRD/BSB funded & 11,573 BSB funded)
2004	29,256 (17,136 feet NRD/BSB funded & 12,120 BSB funded)
2005	Not Completed

Through the process of constructing water mains each year, Butte-Silver Bow has determined the volume of replacement that can be accommodated by various areas of the community. During years when a large volume of replacement was conducted, in concentrated locations, such as 1998, and 1999, problems were encountered in two areas: 1) provision of temporary water to affected homes during the construction phase, and 2) traffic congestion and confusion due to closed streets.

The Butte urban area is not large and consequently the water service area is not large. When water mains are taken out of service for replacement, the affected homes must be provided with an alternate source of water during the approximate 2-week construction period. This temporary water comes from active water mains in adjacent blocks. When a large volume of water main renewals are conducted during a single season, multiple blocks are taken out of service at the same time. It became difficult in the past to provide temporary water service because the water mains in adjacent blocks were out of service simultaneously.



(Picture above shows the amount of room that is available for construction on a typically north Butte street)

To avoid this difficulty for the Water Division and the attendant inconvenience to the customer, renewal volumes are sized each year so that temporary water provision can be assured. For these purposes the best approach for the area of the Butte hill is less than 20,000 lineal feet of renewal during a construction season has proven to work. It should be noted that this approximately 20,000 feet equates to more than 3 miles of water pipe taken out of service during a single construction season and, in an urban setting such as the Butte hill, this amount of pipe being replaced in a short period, while manageable, causes some logistical challenges. On the other hand, water main in areas other than the Butte hill can be replaced simultaneously without significant adverse impact to the community. Consequently Butte-Silver Bow attempts to keep water main renewals volumes on the Butte Hill below 20,000 feet per year while also renewing 10,000 – 20,000 feet of water mains in areas off of the Butte hill.

Likewise, the traffic patterns in the area are greatly disrupted by the water main renewal process. In virtually every case, the water mains underlie the city streets. The construction activity requires the full width of a typical city street; hence, traffic must be detoured during the construction activity. As a result, streets are typically closed to traffic during the approximate 2-week construction period. In the Butte hill area the closing of a large volume of streets during a construction season can greatly hinder vehicular traffic and leads to inconvenience and annoyance on the part of the residents. It also can lead to public safety problems as ambulances, police, and fire vehicles are rerouted from their customary paths through the community. Butte-Silver Bow has noted that in years when a large volume of water main was replaced in a concentrated area in a single season, these problems were markedly increased.

When ever possible, Butte-Silver Bow coordinates with other public works divisions. For example, during the 2005 construction season, sewer main replacement was also completed on two of the streets identified for water main renewal. Also, chip and sealing is scheduled on a street that was completed by Butte-Silver Bow's Water Division crews. This coordination will help lessen the impact to the public but may also reduce some cost. Some reduction of costs can be realized through mobilization and asphaltting. Butte-Silver Bow endeavors to coordinate sewer replacement with the water mains, but the condition of the sewer dictates where it will be replaced, just as leaks dictate where water main renewal will take place. So, therefore this coordination can be difficult.

ENGINEERING AND CONSTRUCTION COST ESTIMATION

With the rising costs of petroleum products, we no longer can base our estimates from summarization of multiple construction years. Listed below is a table that shows past years of construction seasons and the continuing rising cost of construction. The 2005 construction season contract price for the replacement of 16,700 feet of water main was \$1,734,370. Using that contract amount and incorporating price increases for pipe, asphalt, labor, inflation and a 10% contingency the cost was estimated at \$2,069,881. The acceptable cost estimated for engineering design and construction oversight is 15% of the construction costs or \$310,482. These costs are further detailed in the Budget spreadsheets (Step 6).

<u>Year</u>	<u>Footage Replaced, Contracted</u>	<u>Contract Cost</u>	<u>Unit Cost</u>
1999	25,950	\$ 2,221,492	\$ 85.61 / foot
2000	23,636	\$ 1,881,498	\$ 79.60 / foot
2001	18,833	\$ 1,465,089	\$ 77.79 / foot
2002	17,007	\$ 1,360,457	\$ 93.83 / foot
2003	16,707	\$ 1,645,151	\$ 98.47 / foot
2004	17,136	\$ 1,889,154	\$ 108.78 / foot
2005	NOT COMPLETED		

The estimated fees for water main replacements will provide a level of engineering services that is roughly comparable to that of other public works projects.

PROPOSED WATER MAIN REPLACEMENTS FOR THE 2006 NRD APPLICATION (2007 & 2008 CONSTRUCTION)

The Butte-Silver Bow Water Utility Division maintains a database that tracks all of the leaks experienced within the water distribution system. This database is queried each year and the streets with the highest frequency of leaks are identified for renewal. Based upon current leakage information, the following table details the water mains that are slated for replacement during the 2007 construction season (also refer to the map, Appendix A). Field conditions could cause a modification to this schedule. Such field conditions could be other water mains that unexpectedly develop chronic leaks and are thus bumped to the head of the renewal list, or areas where safety considerations cause a deteriorated water main to be chosen independent of the leak history.

Water Main Renewal Candidates – 2007 Construction Season

STREET	FROM	TO
Aluminum	Montana	Placer
Antimony	Excelsior	Henry
Clayton	Toboggan	Daly
Colorado	Iron	Second
Curtis	Arizona	Ohio
Dakota	Mercury	Silver
Daly	Main	to Plastic on E. Daly
Delaware	Front	Second
Fremont	Dakota	Main
Gladstone Terr.	Toboggan	Main
Henry	Park St.	Granite
Iowa	Front	Second
Lewishon	Excelsior	Henry

Missouri	Front	Main-tie into Main
Oregon	Front	Second
Placer	900 block	1000 block
Porphyry	Montana	Main
Toboggan	Main	Badger Rd
Upton		wyoming east
Woolman	Excelsior	Western Ave.
Maryland	Front	Second
Virginia	Montana	Franklin

WATER MAIN RENEWAL CANDIDATES – 2008 CONSTRUCTION SEASON

STREET	FROM	TO
Aluminum	Maryland	Utah
Waukesha	Excelsior	Western Ave.
Washington	Gold	Galena
Quartz	Excelsior	end
Michigan	Oregon	Atlantic
Atlantic	Michigan	Farrel
Emma	Farrel	tracks
Short	Emma	Ergo
Ergo	Short	end
Illinois	Alabama	East to Plastic
Alabama	End	End
Dexter	Alabama	End
Indiana	Illinois	Alabama
Pennsylvania	Copper	Gagnon
Silver	Montana	Main
Silver	Main	Wyoming
Washington	Iron	Tecumsa
Tecumsa	Montana	Plastic
Diamond	Alabama	Western Ave.
Iron	Main	Maryland
Fremont	Main	Second
Main	Galena	Platinum

F. Project MONITORING Plan

Successful completion of the main renewal project will require careful monitoring on the part of Butte-Silver Bow. This monitoring will commence with the oversight of the consulting engineer. Butte-Silver Bow will require that the design engineers periodically submit their work for review by the Public Works Director and the General Manager of the Water Division. Additionally, the designs performed by the consulting engineer will be submitted to the Montana Department of Environmental Quality (MDEQ) for review. The MDEQ has a staff of professional engineers that review the plans for conformance with state requirements.

During the construction of the water mains, several quality control measures will be employed. Initially, before any construction activity takes place, the contractor will submit detailed plans, called submittals, for all of the materials intended for use in the construction of the water mains. These submittals will detail the products to be used in such applications as water pipe, fire hydrants, valves, fittings, service connections, etc. The consulting engineer will review the submittals for conformance with the bid specifications.

During the actual construction phase of the project, the consulting engineer will provide full- time inspection. The inspector will oversee all phases of construction and will perform quality control checks such as pressure testing of completed pipe sections, compaction testing of the backfill soil, extraction and density testing of the asphalt, etc. As substandard work is discovered, it will be removed by the contractor and replaced with work that meets the specifications. The inspector will keep a running tally of the pipe, valves, fire hydrants, and other fixtures installed.

Following construction of a section of water main, the inspector's field notes will be used to verify that the construction was done properly. These notes will also be used to create record drawings. These record drawings are submitted to the MDEQ, in compliance with state regulations. The drawings also become part of the permanent record of the Water Utility Division.

G. QUALIFICATIONS OF PROJECT TEAM MEMBERS

The Butte-Silver Bow project team for the water main replacement project will be:

John Vandaveer, Public Works Director

Mr. Vandaveer has been the Public Works Director for Butte-Silver Bow since January of 2005. He holds a Professional Engineering degree in Civil Engineering, which brings to this project a wealth of experience in the construction processes, procedures, and techniques. During his previous experience he has provided engineering support for operations, maintenance, and environmental projects, he has extensive knowledge in designing projects, procurement, and managing contracts.

Jean Pentecost, P.E., Water Division Engineer / Operations Manager

Ms. Pentecost is the engineer for the Water Division and the Operations Manager, a position she has held for the past eight years. In this capacity she has overseen pipeline construction projects within Butte-Silver Bow and has developed expertise in the proper construction techniques and in the proper method of contract and specification preparation.

David Starcevich, Public Works Operation Assistant Manager

Mr. Starcevich has been affiliated with Butte-Silver Bow Department of Public Works Water Division since 1996. Daily duties include coordination of general business office functions and water division crews. Within the Water Division he oversees all construction, inspections, records, payroll, training, inventory, complaints, corrective actions and insurance issues.

Robert Boone, Public Works Draftsman and Engineering Tech

Mr. Boone is the Draftsman and Engineering Tech for the Department of Public Works Water Division. In that position he has experience with the water main replacement project. He has field experience overseeing work crews and assuring that the work conducted is in conformance with the plans and specifications.

Jennifer Kerns, Public Works Public Information Officer

Ms. Kerns has worked for Butte-Silver Bow Department of Public Works since 1997 and since 2003 she has worked as the Public Information Officer for Public Works Department. In that position she obtains information, which is used to inform the community on Public Works projects, road detours, newspaper advertising and Public Service Announcements.

This project team, or portions thereof, will perform all duties and tasks outlined in this proposal, and specifically Section 3C. The team will conduct weekly construction meetings with the contractor(s) to assess progress of the project and evaluate any problems encountered or any unanticipated costs. Butte-Silver Bow has found these weekly meetings to be a good tool for keeping a project on track and for addressing problems in a timely manner.

STEP 4 – ENVIRONMENTAL IMPACT CHECKLIST and NARRATIVE

Attached as pages twenty-five and twenty-six in the Environmental Impact Checklist section for the proposed project, as referenced in the grant application guidelines. The proposed project consists of the construction of water mains within the streets of the Butte-Silver Bow urban area – a continuation of an aggressive water main replacement program underway for the past eleven construction seasons. During this past experience, 294,335 feet of water main have been replaced, and Butte-Silver Bow has acquired a good understanding of the environmental impacts of a water main replacement program. Following is a narrative of the items in the Environmental Impact Checklist that have been checked as other than “No Impact.”

13. Aesthetics, visual quality

During the construction phase of the project, there will be “Potentially Adverse” effects to aesthetics and visual quality. This will result from the necessity of excavating within the city streets for the installation of the mains. This effect will be mitigated, to the extent possible, by limiting public access to the disturbed areas. These excavated areas will represent a safety hazard to the walking or driving public, and affected streets will be closed when possible during the construction process.

The actual construction activity will last for approximately two weeks for each renewal segment. Following construction, the area will be returned to the condition that existed prior to construction. In many cases the appearance after construction will be improved due to the repaired street and the absence of numerous street patches that resulted from prior leak repairs.

14. Energy resources, consumption, and conservation

The project will have a “Potentially Beneficial” effect on this item. Water mains will be selected for replacement because of their deteriorated and leaky condition. Replacement of the mains will result in less leakage and, as a result, the conservation of water.

15. Human Health and Safety

The project will have a “Potentially Beneficial” effect on this item. The leaking water mains within the community have potentially adverse impacts on human health and safety. These impacts take the form of road hazards caused by leaking water and by ice, health hazards due to possible contamination of the water system via a leak, and safety hazards caused by inadequate pressure and flow for fire fighting purposes.

18. Nuisances (odor, dust, glare)

During the construction phase of the project, there will be a “Potentially Adverse” impact with regard to the production of dust. Construction practices will be employed to keep the dust generation to a minimum. These practices will include the use of water trucks to dampen the excavated material and keep the dust from blowing, and by timely paving and cleaning of the street once the project segment is complete. By paving and sweeping the area as soon after the excavation

as possible, the street will be returned to a clean, paved condition and the generation of dust will cease.

19. Noise (e.g. separation between housing and construction areas)

During the construction phase of the project, there will be a “Potentially Adverse” impact with regard to noise. This effect will be mitigated by the restriction of the construction activity, in all cases possible, to the daylight hours, typically 8 AM - 6 PM. It is not possible to separate this construction activity entirely from the affected residential area since the water mains to be replaced underlie the streets in front of the residences. However, by restricting the construction activity to the typical workday, most residents will not be subject to a noise problem. Lastly, the equipment used for water main construction; excavators, compactors, backhoes, etc, is equipped with an effective muffler system that keeps noise to a minimum.

23. Industrial and commercial activity

During the construction phase of the project, there will be a “Potentially Adverse” impact with regard to industrial and commercial activity. This adverse effect will take two forms: temporary loss of water service and restricted access to commercial and industrial locations. Historically, these effects have been almost entirely mitigated through the construction practices employed by Butte-Silver Bow. All customers whose water main is taken out of service for replacement are provided temporary water via a hose system. The actual time without water is typically limited to several minutes while the switch is made from the main to the hose, and following construction, from the hose back to the new main.

Construction contracts let by Butte-Silver Bow obligate the contractor to maintain routes, to the greatest extent possible, for foot and vehicular traffic to the affected commercial enterprises. Typically contractors are required to provide signage to direct the people to alternate methods of access for commercial establishments. Contractors are also required to immediately backfill driveway areas to reestablish access to commercial areas.

26. Transportation networks and traffic flow

During the construction phase of the project, there will be a “Potentially Adverse” impact with regard to the transportation networks and traffic flow. This results because streets must usually be closed during the construction phase of the project. In all cases where streets are closed, Butte-Silver Bow requires the contractor to provide signage and detours in conformance with the Manual of Uniform Traffic Control Devices. Also, the contractor must apprise public safety agencies such as the police, fire department, and ambulance services, of all street closures. Following construction, a beneficial effect to the community results from improved roads that are not plagued with numerous patches from water leak repairs.

STEP 5- CRITERIA STATEMENTS

Applicant Name: Butte-Silver Bow Local Government
Project Title: Drinking Water Infrastructure Replacement – Year Six and Seven

Stage 1 Criteria – General Legal Criteria

1. **Technical Feasibility:** Addressed in Step 3; no additional response required.
2. **Relationship of Expected Costs to Expected Benefits**

The costs to implement the Drinking Water Infrastructure Replacement project should be considered a wise investment when compared to the benefits that will accrue to the citizens through the replacement of lost natural resources and related services. The project represents an important step in the massive effort to recover damages to bedrock groundwater from a century of mining pollution.

According to the NRD report in October 1995 (Revised Report and Rebuttal: Assessment of Damages to Groundwater and Literature Review of Water Use Values in the Upper Clark Fork River Drainage, prepared by John Duffield), the lost value of the damaged groundwater in the bedrock aquifer on the Butte Hill can be quantified. Various scenarios were used in the Duffield report to estimate the losses, for example, based on lost access 1) to private wells (\$44-51 million), 2) to a groundwater municipal system in the contaminated area (\$79-90 million), or 3) to a partially groundwater-based municipal system (\$186-217 million). As reflected in the assessment, the lost values are substantial in each of the scenarios. (For more information and data regarding how the lost values were calculated, e.g., number of properties affected, the cost of replacement water, etc., please refer directly to the Duffield report referenced above.)

The cost of the 15-year project proposed by Butte-Silver Bow to the NRD using 2007 estimated costs is approximately \$26,779,084 million, and Butte-Silver Bow ratepayers will match this amount by an additional \$9.6 million. Compared to even the most conservative estimates of the lost value from the damages to groundwater resources, the NRD investment is reasonable and represents just a fraction of the damages.

The public benefits of the project are equally substantial. Although it may be difficult to quantify the full value of replaced water distribution pipelines to system users, it is clear that every foot of pipe replacement is a direct cost to those users, and any support through the NRD program helps reduce that cost. The benefits to the ratepayers will be critical, given that their water rates are among the most expensive in the state. Specifically, the replacement project will reduce the leakage rate, which in turn, will reduce water consumption; water conservation is a high priority in these times of increasing drought, it will also help reduce pumping costs to transport water from surface sources and will reduce treatment costs at the filtration plants. The improved distribution system also reduces exposures from contaminants that would otherwise be in contact with drinking water through failing pipelines.

Other benefits include increased fire protection (e.g., better pressure and flow rates, more reliability), and costs savings due to lower maintenance costs (e.g., fewer pipe repairs). Indirectly, fewer leaking pipes also reduce the potential for property damage and the attendant

insurance claims. Another intangible yet important benefit is the increased assurance in the overall drinking water system and increased confidence in Butte-Silver Bow's capability to provide safe, reliable drinking water to its citizens.

The benefits from this project to help rebuild the existing municipal drinking water system far outweigh the projected costs and only begin to replace the lost services. As documented in the Butte Groundwater Survey (Duffield Report, October 1995), a high proportion of Butte residents would rather be on a private well than the Butte municipal system in the absence of groundwater contamination. That same survey revealed a substantial majority (82%) of the respondents reported that they had experienced problems (e.g., dirty or discolored water, smell, bad taste, boil orders, etc.) with the municipal system. (For the record, it should be noted that the research compiled for the Duffield report was done prior to the \$30 million investment to build treatment plants and other facilities that eliminated most of the problems.) The citizens have suffered great adversity with the municipal system and have invested significantly in its improvements, and the benefits of distribution line replacement will reduce the remaining hardship.

From any perspective, the proposed restoration project, in the form of a replacement of lost resources, is entirely consistent with the goals of the NRD lawsuit and the subsequent settlement of the Butte Hill groundwater claim. Butte citizens would clearly have been better off had the mining pollution not damaged the groundwater resources.

3. Cost Effectiveness

This grant project would provide funds to make strategic investments to replace lost groundwater resources in the Butte urban area by upgrading the existing municipal drinking water system. After reviewing all alternatives, Butte-Silver Bow believes firmly the proposed approach outlined in this proposal accomplishes these goals in the most economical way possible.

The "no action" alternative – that is, to not install new distribution lines – would ignore the substantial weight of evidence presented in the State's damage claim against ARCO. The groundwater resources in Butte have been severely impacted by mining pollution, and the need to restore and rehabilitate natural resources in the Butte area is well documented. On the other hand, the technical feasibility to restore the groundwater for drinking has been determined to be impractical, thus a replacement project is warranted. Likewise, the "no action" alternative would eliminate one of the few viable means to replace the lost services.

Alternative two- Metering the system. That is to meter the entire system to conserve the existing water resources. This alternative would not be cost efficient. The majority of water lost is through water main leakage. Butte-Silver Bow has put water main replacement as the number one priority primarily for increasing the reliability of the system. Another intangible yet important benefit is the increased assurance in the overall drinking water system and increased confidence in Butte-Silver Bow's capability to provide safe, reliable drinking water to its citizens.

Also, Butte-Silver Bow's existing metering rate structure could not support the funding required to implement capital improvements projects. It would involve a rate increase to accomplish the system wide metering. Currently it would also have to be approved by the bonding agents that Butte-Silver Bow is under contract with. These residents are already struggling with the some of

the highest water rates in the state to pay for the improvements made thus far. Butte-Silver Bow is very active in educating the public in water conservation. We have a large public awareness campaign to help consumers understand the importance of water conservation.

Other alternatives to the proposed scope of work considered were varying levels of investment to replace the distribution system. For example, the proposed project, including the NRD funds and Butte-Silver Bow matching funds, would result in the replacement of approximately 255,000 feet of distribution lines over a 15-year period, or 17,000 feet per year. One alternative is to replace 30,000 feet per year over eight years, and another alternative is to replace 10,000 feet over 30 years.

In evaluating alternatives, the primary variable was the optimum level of construction on the Butte hill in a typical construction season. Butte-Silver Bow's experience over the past 14 years provides useful evidence to conduct this evaluation; in that work history, annual performance has ranged from 8,600 and 32,000 linear feet of installed pipe. Our evaluation considered several factors, such as contractor capabilities (mobilization and availability), effective oversight, material quantities, traffic control and safety, impacts of pavement openings, and weather conditions (i.e. length of construction season). Based on the experience, it has been determined that the optimum level for this construction on the Butte hill is about 17-18,000 linear feet of pipe installation on an annual basis.

Therefore, the best alternative is to secure grant funds from the NRDP over an extended period, at a moderate level of investment whereby Butte-Silver Bow can manage the project most effectively and pledge the matching funds under a viable schedule. The alternative also gives full consideration to the NRD policy to spend only interest from the fund. The level of NRD funding per year (approx. \$2 million) provides sufficient flexibility within the NRD program to fund additional projects. **It was determined that it is cost effective to request two years of funding. This eliminates duplication of the engineering selection process, contractor selection, and water division staff time spent on grant application development. Therefore money and time would not be depleted and could be utilized on implementing these projects.**

Butte-Silver Bow Water Division is in the process of the development of a Master Plan for the water infrastructure system that serves Butte. Even without the plan currently in place for water distribution renewal, it has been proven that the lack of investment by the ACM has created a major infrastructure problem for the citizens of Butte-Silver Bow. The replacement of the deteriorated water distribution system is one of the highest infrastructure priorities of the community. The accepted rule-of-thumb for maintaining a water utility is that that one percent of the system should be replaced each year. Given its age, the Butte-Silver Bow water distribution system still lags behind. Butte-Silver Bow feels that the presence of a master plan is not required to identify the need to rehabilitate the distribution system.

4. **Environmental Impacts:** Addressed in Step 4; no additional response required.
5. **Human Health and Safety Impacts:** Addressed in Step 4; no additional response required.
6. **Results of Superfund Response Actions**

In planning this drinking water infrastructure replacement project, Butte-Silver Bow has considered the completed, ongoing, and anticipated Superfund response actions. Most significant is the Butte Mine Flooding Operable Unit (BMFOU). The Record of Decision for this response action was made in 1994, and the ROD outlined a number of activities to occur, including (but not limited to) controlling water flow into the Berkeley Pit, establishing critical water levels for the East and West Camps, selecting water treatment technology and sludge generation/ disposal, setting a schedule to construct a water treatment facility, setting performance standards, and establishing a comprehensive water monitoring program, and public education program.

The impact of this decision was substantial on the community, as the water level in the Berkeley Pit is allowed to continue to rise – the last measurement on October of 2005 was 5,255.00 feet above sea level, and the Critical Water Level is 5,410 feet. Current estimates indicate at least 33 billion gallons of contaminated water is held in the Berkeley Pit, and that total is expected to double by 2017, when treatment of the Berkeley Pit water is now scheduled to begin. The closure of mine operations in June 2000 led to expedited planning, design and implementation of a treatment plant for the Horseshoe Bend water source, which had been previously diverted from the Berkeley Pit for use in mining operations. Despite the fact that mining operations resumed in October 2003, the water level in the Berkeley Pit will continue to rise approximately one foot per month.

Perhaps the most devastating component of the Record of Decision, however, was to declare that the bedrock aquifer and parts of the alluvial aquifer on the Butte Hill could never again be used for drinking water. This loss has been characterized as substantial and irreversible, thus, Butte-Silver Bow has proposed this replacement project.

A second Superfund response action will ultimately impact this proposal, the Butte Priority Soils Operable Unit (BPSOU). The Record of Decision for that action remains unsettled and it is premature to speculate how that decision will impact the use of the groundwater. Consequently, at least the first several years of the proposed replacement project has been planned for implementation in the areas where the impacts of the mine flooding decisions are applicable. Likewise, since the Priority Soils decisions are expected to have very little, if anything to do with the bedrock aquifer, the scope of the proposed project is targeted for areas where the impacts of the BPSOU will not be applicable.

7. Recovery Period and Potential for Natural Recovery

Based on the information in the Butte Mine Flooding Operable Unit (BMFOU) Record of Decision, it is not expected that the bedrock groundwater aquifer will ever recover naturally. The EPA issued a ‘Technical Impracticability’ waiver, essentially concluding that no remedial effort would be practical to perform, and therefore the parties responsible for the cleanup were not ordered to implement a remedy to restore the groundwater.

In the NRD’s Butte Groundwater Injury Assessment Report (January 1995), it was concluded that “It can be assumed that hazardous substance sources in the study area will continue to adversely affect alluvial and bedrock aquifer groundwater and Berkeley Pit water for thousands to tens of thousands of years, absent removal of sources or implementation of effective

remediation or restoration techniques.” (Please refer to the full report for more precise information about potential immobilization mechanisms as well as potential enlargement of underground plumes holding contaminated water.)

Based on the several assessments that have been made regarding the groundwater on the Butte Hill, it has been determined that there is virtually no chance that the natural resource will recover naturally. Consequently, Butte-Silver Bow is proposing a replacement project to improve the drinking water infrastructure.

8. Applicable Policies, Rules and Laws

Butte-Silver Bow is mindful of the applicable laws and rules that must be addressed to implement the project (see Step 4. Environmental and Human Health and Safety Narrative for details). Given that the drinking water infrastructure replacement project is proposed within the area currently served by the municipal system, approval procedures with the MDEQ will be fairly standard.

- A. The same procedures and laws applicable to the implementation of water line replacements over the past fourteen years of Butte-Silver Bow ownership will be applicable to this project. As per standard procedures, Butte-Silver Bow will submit all design drawings for segment replacements to MDEQ for review and approval prior to performing the work.
- B. Butte-Silver Bow will also coordinate all replacement activities with the U.S. EPA to ensure any excavated materials that contain heavy metals in excess of remedial action levels are disposed at the mine waste repository and clean backfill materials are used.
- C. Also, as is required through the MDEQ approval process, Butte-Silver Bow will follow the Montana Standard Specifications and Montana Public Works Specifications in the implementation of the project, including those for ditch width, pipe bury depths, safety measures, and related specifications.

9. Resources of Special Interest to the Tribes and DOI

Although there are substantial historic resources in the Butte urban area, there are no known Tribal cultural resources of special interest to the Tribes or DOI in the vicinity of the project area.

Stage 2 Criteria – General Policy Criteria

10. Project Location

Butte-Silver Bow’s Drinking Water Infrastructure Replacement project is located within the urban area and directly corresponds to the geographic extent of the surface area where the groundwater resources have been damaged and are designated for replacement. The first phases

of the proposed project lie entirely within the Butte Mine Flooding Operable Unit (BMFOU) of the National Priorities List as designated by the Environmental Protection Agency (EPA).

11. Actual Restoration of Injured Resources

Resource injuries in the project are significant and primarily related to groundwater. NRD documents state that: “The bedrock groundwater injury covers seven square miles (4,500 acres) and, at this time, has a volume of some 220,000 acre-feet. Less than half of this injured groundwater is in the Berkeley Pit at the present time. However, when the critical water level is approached, the volume of contaminated groundwater in the Pit will exceed the total volume of contaminated bedrock groundwater in the aquifer outside of the Pit and the total volume of injured groundwater will be approximately 333,000 acre-feet”(see page A-4 of the grant application materials).

The proposed project would be considered a “replacement project,” consequently, there would be no actual restoration of the injured resources. It should also be noted, however, that there are severe limitations to the restoration of the injured resources, from both a feasibility and cost/benefit perspective.

As explained in the responses to the legal criteria, the Butte Mine Flooding Operable Unit (BMFOU) Record of Decision declared that the bedrock groundwater aquifer is not expected to ever recover naturally, and the EPA issued a ‘Technical Impracticability’ waiver, essentially concluding that no remedial effort would be practical to perform. Also, as concluded in the NRD’s Butte Groundwater Injury Assessment Report (January 1995), “It can be assumed that hazardous substance sources in the study area will continue to adversely affect alluvial and bedrock aquifer groundwater and Berkeley Pit water for thousands to tens of thousands of years, absent removal of sources or implementation of effective remediation or restoration techniques.”

These and other assessments clearly document that the groundwater resource will not recover naturally and that any project to restore the resource would not be advisable. Consequently, Butte-Silver Bow is proposing a replacement project to improve the drinking water infrastructure.

12. Relationship Between Service Loss and Service Restoration

Service Loss. Groundwater injury in the Butte area is well documented (see Butte Groundwater Injury Assessment Report, Upper Clark Fork River NPL Sites, January, 1995, and other NRDP documents). In the assessments, groundwater damages have been categorized into two areas, those within the Butte Mine Flooding Operable Unit and the Area One, a subset of the Butte Priority Soils Operable Unit. The focus of this 2006 NRD proposal is the injury associated with the Mine Flooding area, since the Record of Decision for this Operable Unit has been issued (in 1994) and the corresponding damage claim for the Butte Hill groundwater was included in the 1998 NRD settlement. (Note: the Area One claim remains unsettled and the Record of Decision for the Butte Priority Soils Operable Unit.)

The sources of groundwater contamination in the Mine Flooding Operable Unit (and, correspondingly, the project area of this NRD proposal) primarily include the underground workings and the mine water therein, the walls of the Berkeley and Continental Pits, waste rock and tailings piles near the Berkeley Pit, leaking solutions from the leach pad, the Weed/MR Concentrator areas, and the Yankee Doodle Tailings Pond. Again, several studies have documented the hazardous substances in the source materials as well as the pathways for groundwater contamination.

It should also be noted that the Record of Decision for the Butte Mine Flooding area stated that it was “technically impractical” to remediate the groundwater contamination. The Record of Decision further stipulated that to protect human health, a ground water control area and other restrictions needed to be put in place to limit the use of existing wells and prohibit new wells in specific areas. Consequently, the groundwater in large portions of Butte’s urban area can’t be used for drinking, and the services lost as a result of the injuries are immense. For just the bedrock aquifer on the Butte Hill, the 1995 NRD assessment estimates lost groundwater resources at 6,900 gallons per minute (gpm) – more water than is used to supply all Butte citizens on a typical day (except during sprinkling season).

Service Restoration. There is a direct connection between the services the proposed project seeks to replace and the services lost or impaired as a result of the injuries to natural resources for which the State claimed damages. In the project area, there are thousands of owners of residential properties and hundreds of owners of commercial parcels who have suffered losses due to foregone use of actual or potential wells located over the groundwater contamination.

The proposed infrastructure improvements in the municipal system – particularly the replacement of inadequate distribution lines – will upgrade service to those citizens who can no longer rely on the groundwater aquifer. The investments in the municipal system provide partial replacement of the damaged groundwater resources from the mining activity. These residents are already struggling with the some of the highest water rates in the state to pay for the improvements made thus far (see description in proposal section, Step 3A), and additional, major investments will exacerbate their existing financial burden. These citizens deserve better, particularly since they are precluded from using any alternatives, i.e. groundwater, to meet their needs.

13. Public Support

Butte-Silver Bow’s Drinking Water Infrastructure Replacement program Year Six and Seven project is the first of several projects that begin to replace the lost resources in the Upper Clark Fork River watershed. For that reason, the project has the full support of the citizens. On February 1, 2006, at a meeting of the Butte-Silver Bow Council of Commissioners the Council passed a motion (in concurrence with Communication No. 06-65) to support this project and to provide a letter of support on behalf of its citizens.

In terms of documenting additional support for the project, The Main Street Uptown Butte Association (uptown business association), Cell Phones on the Go (local business owner), Rick Griffith (citizen), Port of Montana (Industrial Business), and other citizen groups have expressed their strong support in the past, and have offered to submit support letters to the NRD program. Those letters should be forthcoming throughout the project review process. It should also be recognized that all drinking water ratepayers express support for the proposed infrastructure improvement project every month when they submit their payments for water service. The proposed project is designed to keep those payments – already some of the highest bills for water service in Montana – from increasing any further.

From a larger perspective, the citizens of Butte-Silver Bow have expressed their support for the proposed project by clearly stating their firm belief that a substantial portion of the NRD settlement proceeds should be invested to restore or replace resource damages in the upper part of the Basin – where most of the damages have occurred. Their belief is reinforced by an equally justifiable notion that investments in the headwaters serve best to restore the entire watershed.

Support letters from the Butte-Silver Bow Council of Commissioners and The Main Street Uptown Butte Association, Cell Phones on the Go, Rick Griffith, and Port of Montana follow at the end of this section.

14. Matching Funds and Cost Sharing

There are two significant cost-share contributions to the project: 1) funds already invested by Butte municipal drinking water system ratepayers over the past fourteen years, greater than \$49 million (see appendix C); and 2) the direct match of funds over the next 15 years of the project period, estimated at roughly \$9 million. Below are two tables that describe the scope of the matching funds for the sixth and seventh years of the project and then for the full 15-year period:

DRINKING WATER INFRASTRUCTURE REPLACEMENT **2006 APPLICATION YEAR 6 & 7 PROJECT BUDGET SUMMARY**

Total Year Six Project Cost	\$2,426,108
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Matching Funds

a) Butte-Silver Bow – in-kind labor	\$45,745
b) Butte-Silver Bow – capital improvement fund	\$595,091

YEAR SIX FUNDING REQUEST	\$1,819,581
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Total Year Seven Project Cost	\$2,498,323
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Matching Funds

a) Butte-Silver Bow – in-kind labor	\$46,549
b) Butte-Silver Bow – capital improvement fund	\$612,943

YEAR SEVEN FUNDING REQUEST

\$1,873,742

DRINKING WATER INFRASTRUCTURE REPLACEMENT 15-YEAR PROJECT BUDGET SUMMARY (USING YEAR SIX COSTS AS AVERAGE)

Estimated Total Project Cost **\$36,391,627**

Matching Funds

a) Butte-Silver Bow – in-kind labor \$686,182
b) Butte-Silver Bow – capital improvement funds \$8,926,361

PROJECTED NRD CONTRIBUTION **\$ 26,779,084**

It is important to consider the proposed NRD investment in the context of the unconditional investment over the past 14 years – a \$49 million (see appendix C) outlay by the ratepayers to repair, restore and replace the 100-year-old, previously private, now publicly owned system. The projects were not elective, but mandatory to fulfill federal and state orders to upgrade the system. The same citizens who were stripped of their opportunity to tap groundwater were compelled to pay for the improvements. At the time, there was no help available from the NRD settlement. But the bottom line is the same today as it was then: There are no alternatives to these investments since the local groundwater has been permanently damaged by mining activities.

Butte-Silver Bow has taken its duty as the custodian of the drinking water system very seriously. In addition to the matching funds that BSB commits to the NRD supported renewal program, we will also invest over \$500,000 towards water main replacement in other areas of Butte, specifically in the south end of the urban area. Due to boundary constraints, the NRDP project is confined to the Butte Hill. However, Butte-Silver Bow has an obligation to provide adequate and safe drinking water to the entire community, thus we are compelled to allocate ratepayer resources to renewals in other parts of the town.

The proposed match between Butte-Silver Bow and NRD will be a 75/25 split. Butte-Silver Bow will still actively seek additional funding from other sources.

15. Public Access

Generally, public access is not relevant to this proposed project. Specifically, all water mains replaced through the project are publicly owned and within the public right-of-way (i.e., primarily under streets and roads). There will be no changes in public access as a result of this project.

16. Ecosystem Considerations

Butte-Silver Bow believes the project is sequenced properly in the context of a comprehensive watershed management approach. The proposed application was again selected as one of Butte-

Silver Bow's top priorities for application based on two decades of participation in, and observations of the level of cleanup (remediation) done, or more accurately, not done on the Butte Hill. In summary, our community has already been forced to accept the decision that the groundwater will not be restored and the need to deal with the consequences. The proposed project will help continue to deal with those consequences.

From a basin-wide perspective, the proposed project is consistent with Butte-Silver Bow's position that NRD projects should first concentrate on source reduction to address the wastes to be left in the water's way after remedial actions are completed, recognizing the reality that this work will not, ultimately, remove all of the sources. It will take additional restoration investments to maximize source reduction. Where restoration initiatives are not practical, as is the case with the lost groundwater resources on the Butte Hill, the citizens support replacement projects within the geography of the Basin to help compensate for their lost opportunities to use valuable natural resources.

The citizens of Butte-Silver Bow will also continue to participate in the process to develop a large-scale watershed management approach to the NRD program. In that regard, Butte-Silver Bow, in March 2001, released its first "working draft" of a 20-year plan that outlines the projects we believe merit consideration under the NRD program (see Appendix B). We have invited critical comment of our "working draft" as a means to discuss our priorities at the headwaters of the Clark Fork River Basin in the context of the overall resource conditions in the Basin. Toward that end, Butte-Silver Bow staff has participated in the Silver Bow Creek planning effort, initiated in 2002.

17. Coordination and Integration

The proposed project is a long-term investment, with an implementation schedule to complement the timing of a remedial process decision already made and a response action that is already defined. Consequently, we believe the project is fully coordinated and integrated with remedial process decisions/actions and other NRD projects.

In particular, the project is entirely consistent with the State's Restoration Determination Plan. As noted earlier in this application, the State's Plan identified a project to upgrade Butte's antiquated water system as a viable replacement alternative for the bedrock injuries in Butte. In addition, the proposed project does not, in any way, interfere with the State's ongoing litigation on the Butte Priority Soils Operable Unit (i.e., Area One restoration claim). We have selected water line replacements entirely within the boundary of the injured bedrock aquifer, and exclusive of those areas that will be address under the Priority Soils decision and subsequent remedial actions.

18. Government Functions

As fully described in this grant application, the proposed project is a cost-share endeavor using revenue from the NRD settlement and from the drinking water system ratepayers. It should be understood, however, that the scope of the project is not affordable if solely financed by ratepayers, and thus would not be implemented without the NRD support. The reason is clear: The ratepayers are simply not able to accept a financial burden beyond the matching funds committed.

Since public ownership began in 1992, water line replacements have been financed through a combination of ratepayer revenue and settlement funds derived from federal, state, and class action lawsuits against the former owners of the municipal system. In general terms, the lawsuits were filed with respect to violations of the Clean Water Act and the delivery of substandard water to customers. During the fourteen-year period of public ownership, the ratepayer revenue applied to line replacements has been at the same level – approximately \$500,000 per year – as is now proposed in this grant application. The funds from the water quality lawsuits were fully expended through the 2001 construction season, and had produced the additional capital – averaging \$1.35 million per year – to expedite the replacement schedule.

In short, the costs Butte-Silver Bow faces to upgrade our system are greater than a typical community would face, due to the pervasive groundwater contamination underlying Butte. In the absence of that injury, Butte-Silver Bow would have been able to construct a much simpler and less expensive groundwater system than its existing system. Our ratepayers' costs are significantly higher than other similar communities in Montana, for example, Butte ratepayers pay almost twice as high as Great Falls and Kalispell.

Cities	Water 1300 Cubic Feet	% Lower than Butte
Butte	\$36.04	0%
Missoula	\$33.66	7%
Helena	\$28.86	20%
Kalispell	\$19.55	46%
Bozeman	\$26.78	26%
Billings	\$24.13	33%
Great Falls	\$19.16	47%

Without funds from the NRD program, the level of replacement would have to be decreased dramatically. For example, the schedule to complete the 255,000 feet contemplated in the proposed 15-year program would have to be extended to almost 50 years. But that timeframe would force the system users to bear the impacts of reduced service for their lifetime, despite the fact that mining damages have eliminated their opportunity to use groundwater as an alternative. Their use of NRD settlement funds to replace damaged groundwater resources would be lost. Ultimately, these same citizens would actually be penalized for their considerable investment in the past and future decades to cope with the demands of re-building the 100-year old system.

STEP 6 – PROPOSAL BUDGET

Applicant Name: Butte-Silver Bow Local Government
Project Title: Drinking Water Infrastructure Replacement – Year 6 and Seven

A. Budget Estimate

The Budget Estimate, *Chart A: Project Budget Summary*, is presented in the format outlined in the grant application materials. In summary, the total project cost for year six is **\$2,426,108**. Of this amount, the sponsor requests **\$1,819,581** through the Natural Resource Damage Program and pledges **\$606,527** as a match of in-kind services and capital improvement expenditures. The total project cost for year seven is **\$2,498,323**. Of this amount, the sponsor requests **\$1,873,742** through the Natural Resource Damage Program and pledges **\$624,581** as a match of in-kind services and capital improvement expenditures.

B. Budget Narrative

1. Salaries and Wages

As described in Step 3, Section C, and outlined on *Chart B: Project Staffing Summary*, there will be a number of Butte-Silver Bow staff involved in the project. Mr. John Van Daveer, Butte-Silver Bow Public Works Director, will provide project direction and oversight. It is estimated that he will spend approximately 82 hours directly on grant-related activities.

In support of Mr. Van Daveer will be Jean Pentecost, BSB Public Works Operations Manager. Ms. Pentecost also has extensive knowledge of the system. She will help with oversight of design engineering, consultant liaison, and construction quality control. As described in Step 3, Technical Narrative, and Chart B, it is estimated she will spend approximately 404 hours directly on grant-related activities.

Also supporting the Butte-Silver Bow water main replacement program will be the Water Division Shop Manager and Personnel. These individual will devote approximately 232 hours to grant related activities.

The project staff members will receive support from other technical staff (e.g., draftsman, GIS Specialists, Road Superintendent, etc.) throughout the course of the project. The support personnel will handle a variety of tasks to complete the work in the most cost-effective fashion, providing services in-house where possible to complement the work of the engineering consultant. All of the projected hours by Butte-Silver Bow staff will be provided as an in-kind match.

2. Employee Benefits

Benefits have been calculated using a standard rate of 15.3% of the salaries of the personnel working on the project, plus a direct annual cost of \$6,852 per year for health insurance per the full time equivalent of personnel (FTE) assigned. For example, Ms. Pentecost is a full-time employee and receives benefits calculated @ 15.3% of annual salary, plus \$6,852 for a total of \$13,745 per year. The attached summary sheet, 2005-2006 *Employer Provided Benefits* (Chart C), provides a more thorough explanation of which benefits are provided and the associated costs that comprise the 15.3%. Again, like Salaries and Wages, all benefits are provided as an in-kind match.

3. Contracted Services

There are two significant contracts planned to complete the work outlined in this proposal and to be paid with grant funds. First, Butte-Silver Bow will hire a general construction contractor to complete all water line replacements. The County will use its standard bidding and contract selection processes to secure the most cost-effective contractor for the tasks outlined.

To estimate the total costs for this contract, Butte-Silver Bow analyzed the actual construction costs for the 2005 construction. Research was performed on the current increases and anticipated increases of the pipe, asphalt and labor. These aspects were factored into the construction costs estimates. That cost plus a 10% contingency was applied to the target replacement goal of 17,000 linear feet of varying sizes of distribution water pipeline. (see Chart D) Year seven estimated costs were calculated by increasing year six by a 3% inflation factor.

The cost also includes standard field procedures (e.g., safety, design specifications, etc.), and the contractor responsibility for labor (wage laws), equipment, and materials, including the pipe, valves, connectors, fill dirt, asphalt (to repave street surfaces), among other items.

Thus, Butte-Silver Bow has projected a total amount budgeted for the construction work for the estimated 17,000 feet at \$2,426,108 for year six and \$2,498,323 for year seven. It is anticipated, however, that some street openings (associated with replacing pipe) will cost more than others, and there may be some changes in the precise areas where the distribution lines will be replaced.

A second contract will be with a professional engineering firm. This consultant will perform a variety of tasks outlined in the scope of work, for example, for preparing the engineering specifications for each pipeline segment to be replaced, obtaining MDEQ approval of the designs, and construction oversight. The accepted form of estimating engineering costs for design and construction over site is 15 % of construction costs.

4. Supplies and Materials (see # 9)

Routine office supplies (e.g., paper, pens, computer accessories) will be necessary to conduct work under the grant, but will be provided as in-kind to the project. All supplies and materials for the construction work will be included in the general contract.

5. Communications (see # 9)

Routine communications (e.g., telephone, postage, mailing, advertising bids, etc.) will be necessary to conduct work under the grant, but will be provided as in-kind to the project.

6. Travel – No travel is part of this contract.

7. Rent and Utilities (see # 9)

8. Equipment (see # 9)

9. Miscellaneous – Indirect Costs

As with any project, there are several costs of doing business that cannot be directly attributed to any direct cost line item. For example, the in-kind labor provided by Butte-Silver Bow uses office space, heat, lights, as well as access to personal computers, printers, copy machines, GIS map facilities, and other office equipment. These services are part of a substantial match pledged by Butte-Silver Bow.

A 20% indirect rate has been used to quantify the value of these indirect costs. It is the practice of the county government to estimate indirect costs against the total value of the personnel working on the project. Thus, the 20% has been applied to the \$38,121 in anticipated personnel services, resulting in an overhead expense of \$7,624 for a total of \$45,745 for year 6 and 20% of \$38,791 resulting in \$7,758 in overhead expense for a total of \$46,549 for year seven. Butte-Silver Bow pledges to cover all of these costs as an in-kind match to the project.

MATCHING FUNDS

As reflected on the budget estimate (Chart A), Butte-Silver Bow proposes to provide matching funds of \$640,836 for year six and \$659,492 for year seven. This total is comprised of two components. First, the in-kind labor to manage the contracts and complete all services by the local government. Second, Butte-Silver Bow proposes to provide matching funds to pay for 25% of the engineering services and 25% of the construction services under the project. These funds are secured and approved for expenditure on this project by the local government.

Butte-Silver Bow has taken its duty as the custodian of the drinking water system very seriously. In addition to the matching funds that BSB commits to the NRD supported renewal program, we also invest \$500,000 towards water main replacement in other areas of Butte, specifically in the south end of the urban area. Due to boundary constraints, the NRDP project is confined to the Butte Hill. However, Butte-Silver Bow has an obligation to provide adequate and safe drinking water to the entire community, thus we are compelled to allocate ratepayer resources to renewals in other parts of the town.